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EXAMINER	
SCHINDLER, DAVID M	

ART UNIT	PAPER NUMBER
2862	

DATE MAILED: 10/19/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/632,217	GOVARI, ASSAF	
	Examiner	Art Unit	
	David Schindler	2862	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *25 July 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-22* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-22* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *29 March 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. This action is in response to the communication filed 7/25/2006.

Response to Arguments

2. Applicant's arguments filed 7/25/2006 have been fully considered but they are not persuasive.

With regard to the last full paragraph page 1, as well as the first two paragraphs of page 2 of the Remarks, the Examiner respectfully disagrees. Applicant argues that Schneider does not disclose producing energy field at a plurality of different frequencies in a vicinity of the object (through use of at least one radiator as set forth in Claim 12) and receiving signals that are generated at a location of the object at the different frequencies in response to the energy field (lines 6-8 of the last full paragraph of page 1 of the Remarks). To this, the Examiner notes that Schneider discloses "A signal generator is provided for applying electrical signals to B-field generator coils 11 through 18 to generate a plurality of low frequency electromagnetic field. Any frequency from zero to several hundred kHz may be used. The signals are multiplexed so that: the fields generated by each of the coils are distinguishable" on lines 16-21), and then further discloses that "Time, frequency, phase or various combinations of each can be utilized to distinguish between the various excitations of the generating elements" on column 5, Lines 44-46, and finally discloses that "The multiplexer comprises a conventional circuit for time division multiplexing the signals applied to each of the B-field generating coils. However, it will be appreciated by those skilled in the art that any one of a number of suitable multiplexing techniques may be employed, including time

division multiplexing, frequency division multiplexing, or phase multiplexing and a suitable driver for implementing such a multiplexing technique will be provided" (note frequency division multiplexing) on lines 33-41 of column 23. Therefore, as the frequency may be used to distinguish the various excitations of the generating elements, then each generating element must be generating at a different frequency. Furthermore, the Examiner notes that frequency division multiplexing (FDM) is a technique employed to allow for the simultaneous transmission of multiple signals that are distinct in frequency. Therefore, if FDM is employed, each generating element will transmit at its own distinct transmission frequency. Please see the provided page 58 from SCHAUM'S OUTLINE OF THEORY AND PROBLEMS OF ANALOG and DIGITAL COMMUNICATIONS by Hsu. With regard to receiving signals that are generated at a location of the object at the different frequencies in response to the energy field, the Examiner notes the above response, as well as Figure 11, lines 62-66 of column 22, and lines 42-43 of column 23 of Schneider. Specifically, and as stated on lines 42-43 of column 23, "A sensor **20** receives the electromagnetic fields generated by the source **10**." Note that "The source of electromagnetic fields includes a plurality of field-generation means such as generator antennas or coils 11 through 18" as stated on lines 63-66 of column 22 of Schneider.

With regard to Applicant's argument that Schneider does not disclose making multiple computations of spatial coordinates of the object based on the signals received at the different frequencies (last three lines of the last full paragraph of page 1 of the Remarks), the Examiner respectfully disagrees. The Examiner notes lines 1-7 which

discloses that the methods are iterative. Further, the Examiner notes Claim 1 which discloses "the processor configured to iteratively determine at least two location parameters of the medical device in a patient using a plurality of equations" as stated on line 16-19. Applicant notes lines 15-17 of column 11 which states "All these models (and others not mentioned) can be used to solve the P&O processes that are to be discussed." This statement is also cited by the Examiner in the rejection below. The Examiner notes that because at least one of the previous methods was iterative, and in combination with the 5DOF system, cited by the Examiner (note line 60 of column 22), Schneider does disclose making multiple computations of spatial coordinates of the object based on the signals received at the different frequencies. The Examiner first notes that "an **iterative method** attempts to solve a problem (for example an equation or system of equations) by finding successive approximations to the solution starting from an initial guess" as noted on line 1 of the provided document entitled Iterative Method, from Wikipedia. The Examiner notes that each approximation is a computation, and thus iteration inherently includes making multiple computations. As this iterative process can be used to solve the P&O processes, and in combination with the 5DOF system cited by the Examiner, the Examiner respectfully disagrees with Applicant as Schneider therefore does appear to disclose that the 5DOF system can use the iterative method to solve the P&O, and therefore would include making multiple computations of spatial coordinates of the object based on the signals received at the different frequencies. Also note the 5DOF system, specifically lines 52-55 of column 23 which states "The purpose of the signal processor 32 is to reduce out of band signals

from reaching the process processing stage (where P&O is calculated) and affecting the accuracy of the P&O solution", as well as lines 25-27 of column 23 which states "The D/A 41 is fed a digitized waveform, typically sinusoidal, from the processor 50, which performs the P&O calculation process".

The Examiner notes that while Schneider appears to disclose several methods for computing the P&O, Schneider also appears to state that any of these methods may be used. Therefore, any of the disclosed methods, including the iterative methods, may be used by the 5DOF system to determine the P&O. Therefore, the Examiner respectfully disagrees with Applicant's arguments in the last paragraph of page 1, as well as the first two paragraphs of page 2 of the Remarks.

With regard to the last paragraph of page 2, as well as page 3 of the Remarks, the Examiner respectfully disagrees. Please note the above response which responds to a majority of these arguments. With regard to Applicant's argument that Schneider does not disclose testing a convergence of the computations, and if testing reveals a convergence of the computation, then repeating these steps for N repetitions, where N equals a plurality of times, the Examiner respectfully disagrees. The Examiner notes that the P&O processes appear to converge to a solution (see Column 10, Lines 1-18 and Column 11, Lines 16-23). Again, also note that at least one of the previous methods was iterative, and in combination with the 5DOF system, cited by the Examiner (note line 60 of column 22). Again note that "an **iterative method** attempts to solve a problem (for example an equation or system of equations) by finding successive approximations to the solution starting from an initial guess" as noted on line 1 of the

provided document entitled Iterative Method, from Wikipedia. Thus, it appears, given the combination of the above information, that Schneider does disclose testing a convergence of the computations. With regard to Applicant's argument regarding if testing reveals a convergence of the computation, then repeating these steps for N repetitions, where N equals a plurality of times, see lines 63-67 of column 18, as well as lines 1-7 of column 19. Also note lines 35-67 of column 17, as well as lines 1-23 of column 18.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1- 22 are rejected under 35 U.S.C. 102(b) as being anticipated by Schneider (6,073,043).

As to Claim 1,

Schneider discloses (i) producing energy fields at a plurality of different frequencies in a vicinity of the object (60) ((Column 5, Lines 44-46 / note: frequency) and (Column 23, Lines 16-21) and (Figure 11)), (ii) receiving signals that are generated at a location of the object at the different frequencies in response to the energy fields ((Column 22, Lines 62-66) and (Column 23, Lines 42-43)), (iii) making multiple computations of spatial coordinates of the object based on the signals received at the

different frequencies ((Column 9, Lines 8-67) and (Column 10, Lines 1-67) and (Column 11, Lines 1-49 / note lines 16-17)), (iv) ascertaining whether the energy fields have been perturbed by an article in the vicinity of the object by testing a convergence of the computations ((Column 17, Lines 35-38) and (Column 17, Lines 46-53) and (Column 18, Lines 1-22)), and (v) if testing reveals a convergence of the computations, then repeat steps (i) through (iv) for N repetitions, where N equals a plurality of times ((Column 18, Lines 63-67) and (Column 19, Lines 1-7)).

As to Claim 2,

Schneider discloses producing the energy fields includes producing magnetic fields (Column 22, Lines 62-66), and wherein receiving the signals includes receiving electrical signals which are generated responsively to the magnetic fields (Column 23, Lines 42-51).

As to Claim 3,

Schneider discloses producing the magnetic fields includes driving multiple radiator coils ((11) through (18)) with electrical currents at the different frequencies so as to generate the magnetic fields ((Column 5, Lines 44-46 / note: frequency) and (Column 22, Lines 62-66) and (Column 23, Lines 15-21) and (Figure 11)).

As to Claim 4,

Schneider discloses driving the multiple radiator coils includes driving each of the coils to generate the magnetic fields at a unique, respective set of the frequencies ((Column 22, Lines 62-66) and (Column 23, Lines 15-21)).

As to Claim 5,

Schneider discloses receiving the electrical signals includes receiving the electrical signals from one or more sensor coils that are fixed to the object ((Figure 11) and (Column 23, Lines 42-51) and (Column 24, Lines 22-24) and (Column 23, Lines 65-67) and (Column 24, Lines 1-6)).

As to Claim 6,

Schneider discloses producing the energy fields includes scanning sequentially through a predetermined sequence of the frequencies ((Column 5, Lines 44-46 / note: frequency) and (Column 23, Lines 15-21) and (Column 23, Lines 32-35) and (Figure 11)).

As to Claim 7,

Schneider discloses producing the energy fields includes generating the fields simultaneously at the different frequencies ((Column 5, Lines 44-46 / note: frequency) and (Column 23, Lines 15-21) and (Column 23, Lines 35-41 / note: frequency division multiplexing) and (Figure 11)).

As to Claim 8,

Schneider discloses making the multiple computations includes solving a set of simultaneous equations relating the received signals to the spatial coordinates of the object ((Column 10, Lines 42-44) and (Column 11, Lines 16-17) and (Column 24, Lines 18-19) and (Figure 11)).

As to Claim 9,

Schneider discloses making the multiple computations includes applying an iterative method of approximation to determine the spatial coordinates ((Column 10,

Lines 1-8) and (Column 11, Lines 16-17)), and wherein testing the convergence includes evaluating a convergence criterion of the iterative method ((Column 10, Lines 1-8) and (Column 11, Lines 16-17) and (Column 17, Lines 36-38) and (Column 17, Lines 46-67) and (Column 18, Lines 1-22)).

As to Claim 10,

Schneider discloses testing the convergence includes detecting a discrepancy between the spatial coordinates computed at the different frequencies ((Column 5, Lines 44-46 / note: frequency) and (Column 5, Lines 50-51) and (Column 17, Lines 36-38) and (Column 17, Lines 46-67) and (Column 18, Lines 1-22)).

As to Claim 11,

Schneider discloses upon ascertaining that the energy fields have been perturbed, correcting the computations to compensate for a presence of the article in the vicinity of the object (Column 18, Lines 7-9).

As to Claim 12,

Schneider discloses at least one radiator (10) which is adapted to produce energy fields at a plurality of different frequencies in a vicinity of the object (60) ((Column 5, Lines 44-46 / note: frequency) and (Column 22, Lines 62-66) and (Column 23, Lines 16-21) and (Figure 11)), at least one sensor (20), fixed to the object (Column 24, Lines 22-24), which is adapted to generate signals in response to the energy fields at the different frequencies ((Column 22, Lines 62-66) and (Column 23, Lines 42-51)), and a system controller (50), which is adapted to (i) make multiple computations of spatial coordinates of the object based on the signals generated at the different

frequencies ((Column 9, Lines 8-67) and (Column 10, Lines 1-67) and (Column 11, Lines 1-49 / note lines 16-17)), and to (ii) ascertain whether the energy fields have been perturbed by an article in the vicinity of the object by testing a convergence of the computations ((Column 17, Lines 36-39) and (Column 17, Lines 46-53) and (Column 18, Lines 7-22) and (Column 26, Lines 44-63)), wherein the system controller repeats (i) and (ii) when testing reveals a convergence of the computations for N repetitions, wherein N equals a plurality of times ((Column 18, Lines 63-67) and (Column 19, Lines 1-7)).

As to Claim 13,

Schneider discloses the energy fields include magnetic fields (Column 22, Lines 62-66), and wherein the signals include electrical signals which are generated by the at least one sensor responsively to the magnetic fields (Column 23, Lines 42-51).

As to Claim 14,

Schneider discloses the at least one radiator includes multiple radiator coils ((11) through (18)) and driving circuitry ((71) through (78) and (42) and (41)) ((Figure 11)), which is adapted to drive the radiator coils with electrical currents at the different frequencies so as to generate the magnetic fields ((Column 5, Lines 44-46 / note: frequency) and (Column 22, Lines 62-66) and (Column 23, Lines 15-21) and (Figure 11)).

As to Claim 15,

Schneider discloses the driving circuitry is adapted to drive each of the coils to generate the magnetic fields at a unique, respective sequence of the frequencies ((Column 22, Lines 62-66) and (Column 23, Lines 15-24)).

As to Claim 16,

Schneider discloses the at least one sensor includes one or more sensor coils ((Figure 11) and (Column 23, Lines 42-51) and (Column 24, Lines 22-24) and (Column 23, Lines 65-67) and (Column 24, Lines 1-6)).

As to Claim 17,

Schneider discloses the at least one radiator is adapted to generate the energy fields sequentially with a predetermined sequence of the frequencies ((Column 5, Lines 44-46 / note: frequency) and (Column 23, Lines 15-21) and (Column 23, Lines 32-35) (Figure 11)).

As to Claim 18,

Schneider discloses the at least one radiator is adapted to generate the fields simultaneously at the different frequencies ((Column 5, Lines 44-46 / note: frequency) and (Column 23, Lines 15-21) and (Column 23, Lines 35-41 / note: frequency division multiplexing) and (Figure 11)).

As to Claim 19,

Schneider discloses the system controller is adapted to compute the spatial coordinates by solving a set of simultaneous equations relating the received signals to the spatial coordinates of the object ((Column 10, Lines 42-44) and (Column 11, Lines 16-17) and (Column 24, Lines 18-19) and (Column 24, Lines 22-24) and (Figure 11)).

As to Claim 20,

Schneider discloses the system controller is adapted to compute the spatial coordinates by applying an iterative method of approximation ((Column 10, Lines 1-8) and (Column 11, Lines 16-17) and (Column 24, Lines 18-19)), and to test the convergence of the computation by evaluating a convergence criterion of the iterative method ((Column 10, Lines 1-8) and (Column 11, Lines 16-17) and (Column 17, Lines 36-38) and (Column 17, Lines 46-67) and (Column 18, Lines 1-22)).

As to Claim 21,

Schneider discloses the system controller is adapted to test the convergence by detecting a discrepancy between the spatial coordinates computed at the different frequencies ((Column 5, Lines 44-46 / note: frequency) and (Column 5, Lines 50-51) and (Column 17, Lines 36-38) and (Column 17, Lines 46-67) and (Column 18, Lines 1-22) and (Column 26, Lines 44-62)).

As to Claim 22,

Schneider discloses the system controller is adapted, upon ascertaining that the energy fields have been perturbed, to correct the computations to compensate for a presence of the article in the vicinity of the object ((Column 18, Lines 7-9) and (Column 24, Lines 18-19) and (Column 27, Lines 7-9)).

Conclusion

5. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David Schindler whose telephone number is (571) 272-2112. The examiner can normally be reached on M-F (8:00 - 5:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Lefkowitz can be reached on (571) 272-2180. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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